UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TENNESSEE
at WINCHESTER

AARON HILL, *et al.*,	)	
	)	
Plaintiffs,	)	Case No. 4:16-cv-117
	)	
v.	)	Judge Mattice
	)	Magistrate Judge Steger
KIA MOTORS AMERICA, INC., *et al.,*	)	
	)	
Defendants.	)	
	)	

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TENNESSEE
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ROGER DALE PARKS, *et al.*,	)	
	)	
Plaintiffs,	)	Case No. 4:16-cv-118
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v.	)	Judge Mattice
	)	Magistrate Judge Steger
KIA MOTORS AMERICA, INC., *et al.,*	)	
	)	
Defendants.	)	
	)	

PLAINTIFFS' MEMORANDUM IN RESPONSE TO DEFENDANTS' MOTION FOR SUMMARY JUDGMENT

Plaintiffs in the action entitled *Aaron Hill, et al. v. Kia Motors America, Inc., et al.* and Plaintiffs in the action entitled *Roger Dale Parks, et al. v. Kia Motors America, Inc., et al.* hereby respectfully submit their Memorandum in Opposition to the Motion for Summary Judgment of Kia Motors America, Inc. (KMA) and Kia Motors Corporation (KMC).

INTRODUCTION

KMA and KMC (The "Kia Defendants") argue there is "no evidence" of a defect that caused the crash, but the bulk of their memorandum is spent trying to explain away the inconvenient fact there was such evidence -- a persistent electronic malfunction in the car's cruise control system -- specifically, a chronically *stuck* "Resume/Accel" switch. The evidence of Diagnostic Trouble Code (DTC P0564, Doc. 278-2) being recorded on at least nine occasions. The cruise control multifunction switch, via the Resume/Accel function, is the only feature in the car, other than the accelerator pedal, that directly communicates to the open throttle. Similar to a "sticky accelerator pedal", a "stuck" cruise control switch can create an unwanted, sudden acceleration.

The Kia Defendants primarily rely on the testimony of their expert, Eddie Cooper, a mechanical engineer whose specialties appear to be assessing crashworthiness, seatbelt restraint systems design and performance, airbag design and performance, and other unrelated issues. The instant case is apparently Cooper's first involving unintended acceleration (UA). Mr. Cooper claims to have no knowledge of the Toyota unintended acceleration investigation, even though his former employer, Exponent, was a primary retained expert defending Toyota.

Mr. Cooper claims the cruise control system must go through a "combination lock" of 10 discrete steps (counsel says 12), in a specific sequence, for a specific duration for each, before the throttle can open -- making the process appear as if it has more steps than it does.[1] Cooper illustrates this with his chart (**Doc 317-10, Cooper deposition Exhibit 16, Doc. 313-21**) showing colorful representations of the voltages as they go back and forth in their prescribed

[1] For example, he describers the first step as, in effect, "turn on the car." We know the Parks ignition was on.

sequence to open the throttle. Looking at this complex electrical system, one must ask, tongue in cheek, what could possibly go wrong?

Mr. Cooper explains only how the system is ***supposed*** to work, but we know something can go wrong and did so in the Parks car. The purposed of DTCs is to monitor and identify defects and failures. Cooper's chart implies the Resume/Accel switch can't be activated until the "On/Off" and "Coast/Set" switches are activated, but there are nine examples of where the Resume/Accel switch was "stuck" in the Parks vehicle -- obviously bypassing the steps Mr. Cooper claims are necessary predicates for activating that function.

As will be discussed in more detail *infra*, Plaintiffs' experts Samuel Sero and Byron Bloch disagree with Mr. Cooper that these steps are virtually impossible to bypass and they opine that KMC's cruise control system can cause unintended throttle opening for which there is no adequate failsafe.

1. SUMMARY JUDGMENT STANDARD

Rule 56(a) of the Federal Rules of Civil Procedure provides that "[t]he court shall grant summary judgment if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." In ruling on a motion for summary judgment, the court must draw all reasonable inferences in favor of the nonmoving party. McLean v. 988011 Ontario Ltd, 224 F.3d 797, 800 (6th Cir. 2000). The moving party has the burden of conclusively showing the lack of any genuine issue of material fact. Smith v. Hudson, 600 F.2d 60, 63 (6th Cir. 1979). The Court cannot weigh the evidence, judge the credibility of witnesses, or determine the truth of any matter in dispute. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 249 (1986). Unless the court can definitely conclude that a fair-minded jury could not

return a verdict in favor of the nonmoving party based on the evidence presented, it cannot enter summary judgment. Id.; Lansing Dairy, Inc. v. Espy, 39 F.3d 1339, 1347 (6th Cir. 1994)

FACTS

On December 31, 2015, driver Mary Parks experienced a sudden unintended acceleration event due to a runaway throttle condition with her 2008 Kia Optima MG automobile that resulted in three fatalities. The subject vehicle included a 2.4L Theta engine, an electronic throttle control system including electronic cruise control functionality. The Kia Optima lacked several features; it neither had an anti-lock braking system (ABS), nor the Kia "Smart Pedal" brake throttle override system. (Walker depo, p. 49, ll 4-12 and p. 193, ll 3-14.)

The late Mary Parks, with her sister, passenger Jimmie Ruth Northcutt, were driving a regular route only four miles from their family's home. They were very familiar with these roadways and the weather conditions were unremarkable. Ms. Parks was not in a rush and had a history as a safe, cautious driver. It is undisputed that there were no unexpected traffic scenarios, no unforeseen external hazards, nor any unexpected obstacles presented for her to navigate. (Young deposition, pages 180, 201). She had no reason to end up at the intersection where the subject incident vehicle crash occurred – except something was wrong with her car that tragic New Years Eve.

Mary Parks intended destination was the local Kroger grocery store to buy milk. While driving on Dinah Shore Boulevard, where the posted speed limit is 30 miles per hour, she intended to make a left-hand turn into the Kroger parking lot. Because she experienced a sudden uncommanded acceleration of the subject Kia Optima, she missed the Kroger store and was unable to adequately slow the vehicle with the foot brake due to the depletion of the vacuum assist in the power brake from the wide-open throttle condition. The subject vehicle continued to

accelerate uncontrollably for over thirty seconds up to over 90 mph, traveling over half a mile from near the Kroger grocery store towards the traffic intersection where the horrific crash occurred.

The Winchester police department and others were understandably concerned about the inexplicable nature of the fatal subject incident. Retaining the assistance of U.S. Congressman DesJarlais, law enforcement reached out the National Highway Traffic Safety Administration (NHTSA) for assistance. A NHTSA investigator attended the first inspection of the subject vehicle on January 20, 2016. KMA's Alan Dow downloaded data only from the Optima's airbag control unit (ACU). Kia and their experts then represented that no evidence of any defect existed and therefore pedal error was the likely cause of the subject crash.

NHTSA published a Special Crash Investigation (SCI) report for the subject incident around May 2018. The NHTSA report abstract concluded that "no historical DTCs were found." (NHTSA Special Crash Investigations Report, 2008 Kia Optima, May 2018, Doc 204-5., PageID# 4318). In July 2018, the Court ordered the defendants to download all available data from all modules and interpretation by the PCU component manufacturer in Korea unveiled that historical diagnostic trouble codes were recorded in the subject vehicle; most importantly DTC P0564 related to cruise control faults.

PROCEDURAL HISTORY

On December 21, 2016, the Hill Plaintiffs filed their complaint against Defendants Kia Motors America, Inc., (KMA) the marketer and distributor of the subject vehicle; Kia Motors Corporation (KMC), a Korean company that designed and manufactured the subject vehicle; the Hyundai-Kia America Technical Center, Inc. (HATCI), Kia's the primary contact to NHTSA; Hyundai Motor America, Inc.; and Hyundai Motor Corporation, the primary developer of the

Theta engine platform. The Defendants previously filed motions to dismiss based on jurisdictional and other grounds. The resolution of those motions, and the discovery as to those Defendants, has been held in abeyance.

Discovery against Defendants KMA and KMC ensued over the past two years and at the close of discovery, those Defendants filed *Daubert* motions to exclude four of the liability experts designated by the Plaintiffs: Tyler Kress, PhD; Samuel J. Sero, P.E.; Byron Bloch; and Steven Loudon. Plaintiffs responses to those *Daubert* motions are being filed contemporaneously with their response to the Defendants' Motion for Summary Judgment.

LAW AND ARGUMENT

Under the Tennessee Products Liability Act, a defendant can be held strictly liable under a manufacturing defect theory if its product is either "in a defective condition or unreasonably dangerous at the time it left the control of the manufacturer or seller." *See* Tenn. Code Ann. § 29-28- 105(a). A product is in a "defective condition" under Tennessee law when it is "unsafe for normal or anticipatable handling and consumption." *See* Tenn. Code Ann. § 29-28-102(2). A defective product is "unreasonably dangerous" when it is dangerous to an extent beyond that which would be contemplated by the ordinary consumer who purchases it, with the ordinary knowledge common to the community as to its characteristics, or that the product because of its dangerous condition would not be put on the market by a reasonably prudent manufacturer or seller, assuming that the manufacturer or seller knew of its dangerous condition. *See* Tenn. Code Ann. § 29-28-102(8).

In Tennessee, "[i]t is ordinarily a question for the trier of fact whether the product is in a defective condition [or] unreasonably dangerous to the user." Harwell v. Am. Med. Sys., Inc.,

803 F. Supp. 1287, 1297 (M.D. Tenn. 1992) (quoting Young v. Reliance Elec. Co., 584 S.W.2d 663, 668 (Tenn. App. 1979)). The general rule in Tennessee is that the issue of whether a product is defective or unreasonably dangerous is one for the jury. Jackson v. Gen. Motors Corp., 60 S.W.3d 800, 805 (6th Cir. 2001). *See also* Whaley v. Rheem Mfg. Co., 900 S.W.2d 296, 300 (Tenn. App. 1995). Curtis v. Universal Match Corp., 778 F.Supp. 1421, 1427 (E.D. Tenn. 1991).

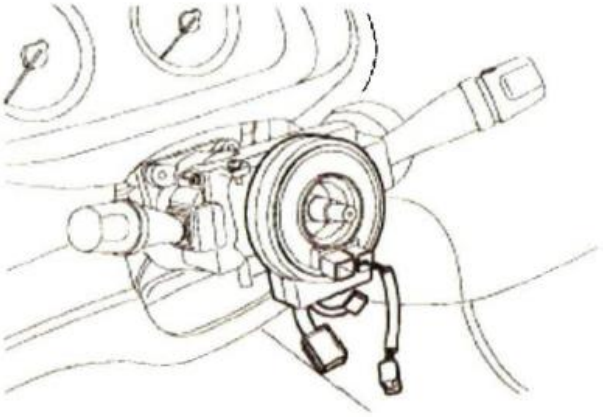
A jury must determine what credibility and weight to give to the evidence presented through expert witnesses and fact witnesses. *See* Brown v. Crown Equipment, 181 S.W.3d 268 (Tenn. 2005)

A product liability action encompasses theories based on strict liability in tort, negligence, and breach of a failure to discharge a duty to warn or instruct. The product must be in a defective condition or unreasonably dangerous at the time it left the control or the manufacturer or seller. Tennessee Code Annotated § 29-28-015(a). A product can be either defective or unreasonably dangerous but need not be both.

The Design of the Electronic Throttle Control System and its Sub-Component, the Cruise Control System, are Defectively Designed and Unreasonably Dangerous.

The cruise control is a subcomponent of the electronic throttle control system (ETC) and in the 2008 Optima, there are four cruise control functions: On/Off, Set/Coast, Cancel, and Resume/Accelerate. The driver activates those functions by pressing control buttons on the steering wheel. Even when the driver turns the cruise control "off", it remains in a "standby" state similar to a television with a remote-control switch. The only way to completely remove energy from the system is to affirmatively press the "cancel" switch or turn off the car. The buttons on the steering wheel are connected to wires in a "clock spring" which is a circular ribbon cable located inside the steering column.

Fig. 4: Identifying Clock Spring And Horn Connector
Courtesy of KIA MOTORS AMERICA, INC.



[*Diagrams*: Kia Clockspring (left) and Cruise Control switches (right) Doc. 313-1, PageID# 7789]

In the 2008 Kia Optima, in additional to the cruise control multifunction switch, the 12-channel clock spring also incorporates the airbag, steering wheel radio buttons, and horn functions. The clock spring's design allows the various electrical connections to be maintained as the clock spring winds back and forth as the steering wheel turns. The wires in the clock spring ribbon cable are routed to the control buttons through a "multi-function switch" that in turn is connected to the main computer (the ECU[2]) by a single wire.

When working as designed, the computer determines which of the three cruise control functions (On/Off, Set/Coast, Cancel, and Resume/Accel) the driver intends by assessing voltages sent along the single wire. Each function is assigned a specified voltage range. Within

[2] The ECU or electronic control unit is also known as the electronic control module (ECM) or powertrain control module (PCU)

those voltage ranges, there is some flexibility, but if the voltage value goes outside the range,[3] the ECU software is supposed to turn the cruise control off.

Diagnostic Trouble Code (DTC) P0564 - "Cruise Control Multi-Function Input A Circuit"

(04 = stuck Resume/Accel switch)

Per the Court's order of July 2018, the parties developed a joint inspection protocol for the December 17-18, 2018 joint inspection. The historical diagnostic trouble codes (DTCs) were downloaded from the subject vehicle's powertrain control unit (PCU), the main computer, sometimes referred to as the engine control unit (ECU). The Kia defendants' experts used specialized equipment for this task. Because these data were in undecipherable code, the flash drive was sent overseas to the PCU manufacturer in Korea, Continental/Siemens VDO.[4] The results, as translated into English, were first sent via email in Excel format by defense counsel and received by undersigned counsel on January 10, 2019. While no saved DTC errors were found, ten deleted DTCs were presented. This specific information about the subject vehicle was not known to the plaintiffs, the Winchester Police Department, NHTSA and other parties prior to January 10, 2019. A "corrected" version of the data was supplied by the defendants on February 28, 2019.

DTC P0564 was only available in ETC vehicles (not in prior cable throttle models prior to 2006) When the Engine Control Module (ECM) has detected a consistent fault in the cruise control switch circuit, for an established duration (e.g. 60+ seconds) this DTC is triggered.

[3] Defense expert Eddie Cooper refers to voltages outside the ranges as "illegal voltages." (Doc 317-10, Cooper depo, p.)

According to Hyundai-Kia documents (Doc. 278-2), some possible causes for DTC P0564 include:

- Open or short in wiring harness
- Poor connection or damaged harness
- Faulty cruise remote control switch
- Faulty ECM (engine control module)

Defendants expert Mr. Cooper claims that ten discrete steps are required before the cruise control system can open the throttle and estimates the chances of this would be one in more than 24 million. But that analysis is misleading. As Mr. Cooper acknowledges, several of these so-called steps are actually one. For example, under questioning by defense counsel, he was asked to agree that his first three steps were separate conditions, but he wouldn't go there; he admitted they were one. (Doc 317-10, Cooper depo at 297, 298). Because a "stuck" accelerator switch was highly likely in the subject vehicle, given its history of malfunctions, there is likely only one additional step required for a voltage range turning the cruise control "on."[5] Such a condition is highly foreseeable in a vehicle with complex electronics, subject to EMI, with no true failsafe, and comprised of defective material such as the clock spring.

As Plaintiffs' expert Byron Bloch describes, the clock spring design has several vulnerabilities. Because its ribbon cable constantly moves back and forth with every turn of the steering wheel, it is subject to wear and tear, and therefore can affect the cruise control, airbag, horn, and radio functions. The clock springs in some of the other 2008 Kia Optimas were recalled for that very reason. (Bloch depo p. 6, Doc 313-1, PageID#7790) Wear and tear can

[5] Mr. Cooper claims the system must recognize the "Set/Coast" voltage before the "Resume/Accel" voltages will be recognized. But KMC's cruise control specification admits that dual failures in both the Set/Coast function and the Resume/accel function may not be recognized. (KMC004557)

induce the system to send signals that are either not within the established voltage ranges ("illegal" voltages), but also to cause voltage signals within the ranges to become "stuck." (Cooper 61, 242, 275, 303) In the latter case, the ECU has no way of recognizing a signal as a malfunction because it mimics a proper signal. (Sero at)

The wires in the clock spring ribbon and in the multi-function switch are vulnerable to electromagnetic interference (EMI). Electronic systems by their nature are subject to EMI and, as described by Plaintiffs' expert Samuel Sero, the electronic components under the hood are constantly generating and receiving electronic signals, some of which can cause the vehicle to malfunction. According to NASA, here are countless such combinations. It is not possible to eliminate EMI entirely; it must be anticipated and guarded against to the extent feasible. A "cross-talk" is a common form of EMI where wires in close proximity "talk" to each other, causing a system to malfunction. As Mr. Bloch explains, the wires embedded on the clock spring ribbon cable can be analogized to lanes on a highway. A highway may be designed to comfortably accommodate four lanes, but problems will develop if it is redesigned to accommodate twelve lanes. Such is the case with the clock spring in the 2008 Optima, with 12 channels.

One indication that the clock spring in the Parks vehicle was exhibiting such discontinuities was the fact that Mrs. Parks brought her car to the dealership twice because the radio was acting erratically. Unfortunately, the technician had no way to access the trouble codes that would have revealed such a problem, so the radio was replaced with no consideration of the clock spring. Obviously, if the clock spring is the problem, replacing the radio is not the solution.

Once the Resume/Accel switch is stuck, the vehicle will continue to accelerate up to the maximum allowed by the cruise control, roughly 96 mph. (Doc 317-10, Cooper depo). This was also confirmed empirically by the testing of Plaintiffs' expert Steven Loudon.[6] Although a stuck Resume/Accel switch can be caused by mechanical sticking, that was ruled out in this case. [Doc 317-10, Cooper depo at 300] Thus, the only way it could have been stuck was through an electronic malfunction, or, which is highly unlikely, Mrs. Parks had pressed a finger on the Resume/Accel button and kept it there for at least 60 seconds -- for a total of nine times and on two occasions more than once in one drive cycle.

The uncontroverted, physical proof is that the Parks vehicle experienced that very malfunction on numerous occasions. On July 13, 2018, the Court ordered the Defendants to disclose the historic diagnostic trouble codes (DTCs) in the subject vehicle's ECU. (Doc. 190) These were not produced to Plaintiffs until January 10, 2019. Those data revealed that DTC P0564 was triggered nine times because of a "stuck Resume/Accel switch." This malfunction became more frequent over time as the chart annexed as **(Doc 317-10, Cooper depo Ex. 11, Doc. 317-7**shows. Further, this malfunction was "stacked" 2 and 3 times in two more recent drive cycles, showing that it was getting progressively worse over time.[7]

KMC unfortunately designed the monitoring system so that the subject DTC P0564 doesn't generate a malfunction indicator lamp (MIL) (informally called a "wrench light") or other warning and won't deactivate cruise control functionality until at least 61 seconds have

[6] Eldon Leaphart is of the opinion that the accelerator button needs to be "feathered" or tapped and released repeatedly and can thereby induce acceleration in increments of only two km per tap. Mr. Leaphart describes this as a "safety measure," but it is disproved by Mr. Loudon's testing and acknowledged to be incorrect by Mr. Cooper.

[7] There could be additional such DTCs that occurred prior to these nine, but the earlier historic data were not provided.

lapsed.[8] Nor can this DTC be discovered by a technician when he or she interrogates the ECU under the usual protocols; it is essentially hidden within the "historic" database and requires a special tool to download and decipher. (Doc 317-10, Cooper deposition at 86). That feature also ensures that a pattern of malfunctions, for example due to wear and tear, that is an unsafe design where the malfunction in question (here, the cruise control) can open the throttle. Indeed, in the subject case, the Kia Defendants had to seek the help of Continental/Siemens VDO, the developer of the ECU, to pull and decipher those codes. Those historic codes were produced to Plaintiffs on February 28, 2019. It was this download that revealed for the first time that the recurring diagnostic trouble code was an electronic problem with the Resume/Accel switch. (Doc 317-10, Cooper depo, Exhibits 11, Doc 317-7 and and 16, Doc. 313-21.)

KMC has programmed its software so that DTC P0564 cannot be triggered -- and thus no mitigation effected -- unless the stuck condition persists for at least 61 seconds.[9] Thus, for 61 to 90 seconds, a predicate for unintended cruise control-induced throttle opening is present. Although there was no DTC triggered during Mrs. Parks's event, that does not mean there was no such malfunction because the event took less than the 61 seconds it takes to trigger DTC P0564.

In summary, during the first 60 or so seconds of the malfunction, the ECU has no way of determining whether there is a malfunction or whether the driver actually wants the car to accelerate. There is no failsafe to address that malfunction -- and that is the essence of the problem.

[8] Eldon Leaphart found that it can take up to 90 seconds [Cite] and Mr. Cooper agrees [Cite].

[9] In practice, this 61 second requirement may take longer. Eldon Leaphart's testing shows that it required 90 seconds in his exemplar vehicle to trigger that DTC (cite) and Eddie Cooper states that the specification requires 90 seconds.

There is no true failsafe for the cruise control in the 2008 Kia Optima

The 2008 Kia Optima's cruise control Resume/Accel function is the only function, outside of the accelerator pedal, that can cause the car to accelerate. Nonetheless, KMC treats the cruise control and the accelerator pedal assembly very differently with regard to critical safety measures, as described below.

KMC's "monitoring concept" recognizes the importance of providing a failsafe to mitigate an inadvertently opened throttle: "The monitoring concept has to prevent an ETC system from dangerous behavior like sudden unintended acceleration against the driver's intent." (KMC 4271) (under seal) Thus, the ECU should have been programmed to recognize electronic faults that mistakenly signal the throttle to open and then to take mitigating action automatically. KMC provides such mitigation with regard to failures in the accelerator pedal assembly and the throttle assembly by providing a redundant fault-checking mechanism built into the system. Specifically, the ECU's software will detect the problem and send the throttle into "limp home" mode, i.e., close to idle. But there is no such mitigation regarding the cruise control. Defense expert Eddie Cooper admits that the ECU will not force the vehicle into the "limp home" mode in response to a cruise control fault as it would if the computer perceives a problem with the accelerator or throttle assemblies. (Doc 317-10, Cooper depo at 80, 81) Instead, the only mitigation built into the system is to send a signal to turn the cruise control "off." (Cooper at 80, 81) But since all the cruise functions are routed through a single wire, the "on" function can be bypassed. (Sero) Thus, the system is vulnerable to single point failures that imperil safety. Plaintiffs' experts Steven Loudon and Samuel Sero both identify this lack of a failsafe as a serious flaw in the cruise control design.

It is misleading to refer to a design defect as a particular voltage drop or "other interference with a surge in amplitude and duration," as Kia claims. The specific errant signals are not the problem; it is the fact the system is not properly designed to withstand the impact of those signals with better shielding and a failsafe response.

In summary, the cruise control design is defective due to the slipshod clock spring design; the use of a single wire to connect the cruise control to the ECM with no true failsafe (contrary to KMC's own specifications); DTCs that are hidden from the driver and technicians; and a delay of mitigation for at least 61 seconds. But the question remains: *What caused the Parks UA incident?* Given the nature of electronic malfunctions, it would be impossible to examine the vehicle and pinpoint the precise manner in which the unintended throttle opening occurred. But there is an ample amount of circumstantial evidence that Mrs. Parks's event was caused by a malfunction of the cruise control:

- There were nine DTC P0564 events in the Parks vehicle prior to the crash identifying a stuck accelerator switch, a malfunction that cannot be diagnosed for at least 61 seconds. This malfunction got progressively worse, occurring more and more frequently.

- The accelerator pedal in the Parks vehicle was in the neutral position at the time of the crash. Mrs. Parks was not responsible for the fact that her car was going 92 mph with an 80% open throttle at the time of the crash. Something else obviously caused those conditions.

- The digital signature of a cruise control-induced acceleration is demonstrated by the testing of Mr. Loudon: approximately 4,200 rpms, 80% throttle opening, and 92 mph -- the exact signature of the Parks event. As Mr. Loudon testified, no other explanation makes sense. Telling, the defense did not do what Mr. Loudon did; there was no rebuttal to his findings.

- It is uncontested that braking effectiveness is dramatically reduced as the vacuum assist is depleted after only a few pumps of the brakes during a wide-open throttle (WOT) condition.

- Human factors studies and expertise, including the reports and depositions of plaintiffs' expert Dr. Kress and Defendants' expert Dr. Young, address alleged unintended

acceleration event with a duration over 30 seconds and over a half-mile distance to be highly unlikely attributed to driver error or pedal misapplication.

- Eyewitnesses to the event showed that Mrs. Parks was controlling her car as a rational person would and she made several dying declarations stating that the car could not be stopped. Specific details discussed in the plaintiffs' response brief for Dr. Kress.

This evidence is ample reason this case must be decided by the jury.

BRAKE THROTTLE OVERIDE (KIA "SMART PEDAL")

Experts Mr. Loudon, Mr. Sero, and Mr. Bloch have all opined that the 2008 Optima is defective for a lack of a brake override, a feasible alternative measure that would have prevented the accident.[10] (Cite) The brake override is a software feature giving the ECM with the ability to assess whether the driver has his foot on the brake at the same time the ECM is sending signals to the throttle to open. If there is such an inconsistency, the software will automatically close the throttle. This feature was feasible and available at the time of the manufacture of the 2008 Kia Optima. Kia began installing this feature in the Kia Borego in May 2008 and many other manufacturers had well years before that date. Pan Sang Kim, KMC's corporate representative, admitted that the 2008 Optima could have been reflashed to have the brake override installed. (Cite) The Defendants claim that the presence of a brake override would have made no difference is predicated on the assumption that Mrs. Parks had her foot on the accelerator instead. But there is ample evidence her foot was not on the accelerator. In any event, that is an issue for the jury.

Brakes: Brake Booster and Loss of Effectiveness at WTO

[10] The Defendants argue that Mr. Loudon does not state that it would have made a difference in the event, but that is not true. Even defendant HATCI's Mr. Babcock agrees BTO is a crucial safety technology. See page ___ of his Report.

The Defendants contend that the brakes on the 2008 Optima are sufficient to stop the car and claim Mrs. Parks could not have had her foot on the brake because the car would have stopped. But Mr. Loudon's testing proves otherwise. His testing shows how braking effectiveness in a 2008 Optima is substantially impeded when the throttle is open and its vacuum boost depleted. He accelerated a 2008 Kia Optima exemplar at WTO and attempted to stop, creating the worst case by pumping the brakes. At 50 to 60 pounds of force, an expected amount of force one would expect from an elderly, octogenarian woman. (Exhibit X, Young's Surrogate study). Mr. Loudon at best was able to keep the car's speed from accelerating, but it would not stop. It wasn't until he applied approximately 150 pounds of force that he began to reduce the speed of the vehicle. Thus, under those conditions, there is a greatly diminished braking capacity, requiring a much greater distance and longer time to stop. (Mr. Loudon's braking tests are discussed at pages --- of his report and pages 114, 117-118 of his depo)

Defendants' expert Mr. Walker also performed braking test. He braked against wide open throttle (WOT) while driving at 30 and 55 mph after intentionally depleting the vacuum supply to the brake booster. At an initial speed of 30 mph, the brakes required 160 pounds of force to stop the vehicle after 135 feet. At 55 mph, it got worse, requiring 170 pounds of force to stop after 235 feet (Walker report at 47) -- many times the usual force required to stop a car and likely beyond the ability of a woman like Mrs. Parks to muster. (Loudon depo at 119.)

In effect, the braking tests of Walker and Loudon show the same thing -- they demonstrate that the fact the Parks vehicle kept accelerating does not prove that Mrs. Parks did not have her foot on the brake. She did, but the brakes required more force to slow or stop than she could reasonably muster.

Accelerator Pedal in the subject Kia Optma

The uncontroverted evidence proves that Mrs. Parks did not have her foot on the accelerator pedal at the time of the crash. Thus, there is no way, other than by a vehicle malfunction, to explain how the throttle plate was stuck in an 80% open position. In his first report, Mr. Walker concluded:

> Because the accelerator pedal was in a depressed position at the time the crash forces deformed the toe pan and floorboard, this indicates that *the accelerator pedal was being depressed at the time of the crash.* Had the accelerator pedal not been depressed at the time of the crash, it would have been in the return, or idle, position and could not have been trapped by the toe pan with floorboard deformation.

Walker Report of March 18, 2016, Doc. __ at 5). Emphasis added.

Mr. Walker had to retreat from that position when a later inspection revealed that the accelerator pedal voltages proved that the pedal was actually in the idle position at the time of the crash. (Walker depo, p. 180: 11-15). Doc. ,) Mr. Walker then has to adjust his opinion. His second explanation was based on his 3D computerized testing that he claimed proved that "had the accelerator pedal been in the idle position at the time of the initial impact, it could not have been trapped by the toe pan and floorboard," reasoning that the crash forces had pushed the dash panel rearward while simultaneously pushing Mrs. Parks's foot forward, thereby returning the voltages to idle. (Walker report at 22, 24)

Mr. Loudon's rebuttal report of April 30, 2019 (Doc. 311-3) conclusively refutes Mr. Walker's latest theory. Photographs of the subject accelerator pedal show a 1/2" gap between the pedal and its bracket -- a gap that proves it was in the idle position. (Show photo.) Thus, as Mr. Loudon recounts in his rebuttal report, "the pedal was clearly stuck in the idle position and not, as Mr. Walker asserts, in a depressed position." The electrical measurements as well as Dr. Kress's photographic evidence show that "t*his is the only conclusion once could possibly make."*

(Rebuttal report at 5, emphasis added) Mr. Walker's computerized analysis was misleading because it used an exemplar pedal in the fully depressed position without the ½" gap.

Tellingly, the Kia Defendants do not question Mr. Loudon's rebuttal report or present contrary evidence.

Negligent Design

As Mr. Loudon explains, if Kia had performed an FMEA on the electronic throttle control system, it would have had to acknowledge that this failure mode was possible, foreseeable, and caused by a single point failure. As Mr. Loudon further explains, where a single fault can cause an unsafe condition, the design is *per se* defective and unsafe. (Cite)

Remarkably, the Korean corporate representative who was designated to testify as to the ETC claimed he had never seen such an FMEA. Although Siemens may have created one (that Mr. Kim described as "confidential" and not available to KMC), that would be only for the one component, the ECM. It is the responsibility of the manufacturer to do an FMEA for the entire vehicle.

- KMC's ETC design engineers denied having any knowledge of unintended acceleration complaints. (KMC's Kim at p.61, Doc 234-3, ; KMC's Bae at p.28, Doc. 234-4)
- KMC designed the 2008 Optima's cruise control system to delay the diagnosis of a stuck Resume/Accel switch for 61 to 90 seconds before the system can register that malfunction.
- Kia's diagnostics for a stuck Resume/Accel switch for prior key cycles is functionally secret, even though it involves a malfunction in a safety-critical system. it is found only in historic data and cannot be accessed by the technicians. Nor does the MIL light come on to warn the driver.
- The cruise control is subject to single point failures. A single wire connects the cruise control multi-function switch to the ECM, with no redundancy.

- The “monitoring concept” that KMC mandates for the accelerator pedal and throttle position sensors was not employed for the cruise control, even though it, too, can open the throttle. There is no failsafe or “limp home” mode available when a problem occurs with the cruise control.

- The clock spring is comprised of flimsy material subject to wear and tear. In fact, Kia recalled it for that reason.

FAILURE TO WARN

Discovery has produced at least 40 Consumer Affairs Reports, 76 Warranty Claims, 38 Techline Reports response to requests about alleged unintended acceleration.

In 2017, Plaintiffs provided a detailed summary of 77 Vehicle Owner questionnaires from the NHTSA online database of consumer concerns. (Doc. 281-10). One newer example of a recent VOQ report by a concerned citizen in Maryville, TN regarding the sister 2006 Hyundai Sonata logged in NHTSA’s public online database reads:

> “THE CRUISE CONTROL COMES ON BY ITSELF DURING NORMAL DRIVING. AFTER THE "CRUISE" LIGHT COMES ON THE "SET" LIGHT ILLUMINATES AND THE VEHICLE ACCELERATES WITHOUT WARNING. THE BRAKE WILL MOMENTARILY STOP THE ACCELERATION, BUT THE ACCELERATION RESUMES ONCE THE BRAKE PEDAL IS RELEASED. IT OCCURS ABOVE 25 MPH. IT KEPT ACCELERATING AND WOULD HAVE CONTINUED IF I HADN'T HIT THE BRAKES. IHAPPENS REGULARLY, AND WE HAVE PARKED THE VEHICLE.”
> - **NHTSA ID Number:** 11170180 (Bloch depo, exhibit 1, page 1)

This unfortunate UA incident occurred before the date of the subject incident:

> ON MARCH 9TH, 2015, I WAS DRIVING HOME FROM WORK AFTER PICKING UP MY INFANT DAUGHTER FROM DAYCARE WHEN SEVERAL WARNING LIGHTS ILLUMINATED ON THE DASHBOARD OF MY 2006 HYUNDAI SONATA; THE AIRBAG, ABS, AND ESC OFF WARNING LIGHTS.
>
> **IN PREPARATION FOR THE UPCOMING LEFT TURN** INTO MY NEIGHBORHOOD, I TAPPED

THE BRAKE PEDAL TO DISENGAGE THE CRUISE CONTROL AND COAST TO THE INTERSECTION. THE **CRUISE CONTROL DID NOT DISENGAGE**. I APPLIED MORE PRESSURE TO THE BRAKE PEDAL TO SLOW DOWN, BUT UPON RELEASING THE BRAKE THE VEHICLE RETURNED TO THE SET CRUISE SPEED. I NOW APPLIED AS MUCH PRESSURE AS I POSSIBLY COULD TO THE BRAKE PEDAL AND THE CRUISE CONTROL SET LIGHT DID NOT DISENGAGE. THE SONATA DOWNSHIFTED AND **REVVED UP TO 4K RPM ATTEMPTING TO OVERPOWER MY BRAKING.** AT THIS POINT IT WAS TOO LATE TO AVOID THE INTERSECTION. I PLACED THE CAR INTO NEUTRAL AND SWERVED TO AVOID HITTING AN ONCOMING VEHICLE AND MEDIAN, AT THE TURN. THE SONATA SPUN OUT AND CAME TO REST IN THE ONCOMING TRAFFIC LANES AFTER OVERSHOOTING THE TURN.

I VERIFIED MY DAUGHTER WAS UNINJURED THEN PROCEEDED TO DRIVE THE SONATA, AT IDLE, THE REMAINING 1/8TH OF A MILE TO MY HOUSE. AFTER ARRIVING AT HOME, I VISITED HYUNDAI'S AND THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION'S VEHICLE RECALL INFORMATION WEB PAGES AND FOUND NO RECALLS REGARDING MY SONATA'S VIN. *TR

Source: **NHTSA ID Number:** 10693361 *(emphasis added)*

NASA Engineering and Safety Center Study of Unintended Acceleration in Toyota Vehicles reads that “Functional failures of the cruise control can result in 0.06 g’s, or 2.12 kph/s, acceleration and may not generate a diagnostic trouble code. The NASA study reads "A resistive short of the cruise control signal wire to ground of the Cruise Control "Resume/Accelerate" with the cruise control engaged, will result in the vehicle accelerating to the maximum speed threshold of the system."

KMA IS A PROPER DEFENDANT

The Defendants improperly claim Kia Motors America, Inc. (KMA) is not liable because it is a seller, not a manufacturer, and thus this action is barred by Tennessee law. Plaintiffs assert that KMA had substantial involvement with Kia vehicles and that KMA must remain a party in this matter because of substantial control of the U.S. version of the 2008 Kia Optima, specifically KMA’s significant involvement with the testing and labeling.

Specific details are provided in the plaintiffs response to KMA and KMC’s statement of supporting factual positions. Thus, because of the substantial involvement and essentially

exclusive control by KMA over the testing, labeling, sales, marketing and distribution of Kia vehicles, including the subject 2008 Kia Optima in the case at bar, it is appropriate that KMA remain a party in this matter pursuant to T.C.A. § 29-28-106 (1).

CONCLUSION

There is copious evidence in the record that there are disputed material facts as to whether the subject vehicle was defective or unreasonably dangerous and proximately caused this incident. Plaintiffs respectfully ask this honorable Court to deny the defendants motion in its entirety.

Dated: June 20, 2019

Respectfully submitted,

THOMAS J. MURRAY & ASSOCIATES
BY: s/ Thomas J. Murray
Thomas J. Murray, *pro hac vice*
tom@thomasjmurraylaw.com
James W. Murray, *pro hac vice*
jim@thomasjmurraylaw.com
358 North Main Street
Huron, Ohio, 44839
(419) 616-0097

KEETON & PERRY
BY: s/ C. Brent Keeton
C. Brent Keeton (BPR No. 22147)
401 Murfreesboro Highway
Manchester, Tennessee, 37355
(931) 723-7145

Attorney for Hill Plaintiffs

ROGERS, DUNCAN & NORTH
BY: s/ J. Stanley Rogers
s/ Christina Henley Duncan
J. Stanley Rogers (BPR No. 2883)

Christina Henley Duncan (BPR No. 13778)
Attorney for Parks Plaintiffs
100 North Spring Street
Manchester, TN 37355
(931) 728-0820

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 20th day of June, 2019, a true and exact copy of this Response was filed electronically. Notice of this filing will be sent by operation of the Court's electronic filing system to all parties indicated on the electronic filing receipt. All other parties will be served by regular U.S. mail. Parties may access this filing through the Court's electronic filing system.

Christopher C. Spencer, Esq.
Attorney for Defendants
6800 Paragon Place, Suite 420
Richmond, Virginia, 23230

John Randolph Bibb, Jr., Esq.
Attorney for Defendants
424 Church Street, Suite 2500
Post Office Box 198615
Nashville, Tennessee, 37219

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I HEREBY CERTIFY that on June 20, 2019, a true and exact copy of this motion was filed electronically. Notice of this filing will be sent by operation of the Court's electronic filing system to all parties indicated on the electronic filing receipt. All other parties will be served by regular U.S. mail. Parties may access this filing through the Court's electronic filing system.

/s/ James W. Murray
Attorney for Plaintiffs